FW: Identified Injection Wells

Charles Lord to: Nancy Dorsey 12/14/2012 09:26 AM

History: This message has been forwarded.

From: Holland, Austin A. [mailto:austin.holland@ou.edu]
Sent: Thursday, December 13, 2012 2:56 PM
To: Charles Lord
Subject: FW: Identified Injection Wells

Attached is the presentation that Rall Walsh, Mark Zoback's student at stanford, presented at AGU and the wells within the Woodford area that have a possible correlation to injection. I sat in his talk so if you have questions please let me know.

Later,

Austin

From: Rall Walsh <frwalsh@stanford.edu>
Date: Tuesday, December 11, 2012 2:28 PM
To: Austin Holland <austin.holland@ou.edu>
Cc: Mark D Zoback <zoback@stanford.edu>, "Keller, G. Randy" <grkeller@ou.edu>
Subject: Re: Identified Injection Wells

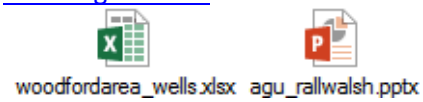
Austin,
see attached. The wells are those located within 20 km of the 4/15/2010 NEIC event M=3.2 located at 34.631,-96.268. Cheers,
-Rall

Graduate Student
Stanford University
Department of Geophysics
Stanford, CA
On Tue, Dec 11, 2012 at 11:37 AM, Holland, Austin A. <austin.holland@ou.edu> wrote:
Rall,

When you have a chance I would appreciate the injection wells you identified as potentially inducing earthquakes. This will help aid discussions with the Oklahoma Corporation Commission. If you don't mind I would like to pass on your presentation as well.

Thanks,

--
Austin Holland
Research Seismologist
Oklahoma Geological Survey
(405)325-8497
Www.ogs.ou.edu



Fall off test Stasta #1

Charles Lord to: Susie McKenzie, Ken-E Johnson, Nancy Dorsey

12/18/2012 11:32 AM

Cc: Ron Dunkin, Tim Baker, Patricia Downey

Susie, thanks for the offer of help.

We need to determine if there is a perm barrier and its distance from the well bore.

Also if there is skin damage at the borehole.

If you could design a falloff test procedure for this well it would be much appreciated.

If you need more information than I have attached please let me know.

Charles Lord
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Oklahoma Corporation Commission
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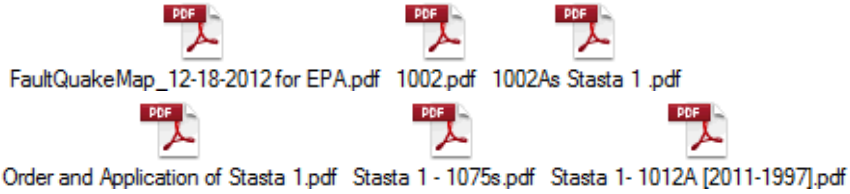
(405)522-2751
c.lord@occemail.com



FW: AGU presentation

Charles Lord to: Nancy Dorsey 12/19/2012 10:40 AM

History: This message has been forwarded.

The title is a bit of a surprise. A bit premature I would think.

-----Original Message-----
From: Katie Keranen [mailto:keranen@ou.edu]
Sent: Monday, December 17, 2012 4:03 PM
To: Charles Lord
Subject: Re: AGU presentation

Charles,

Here is the presentation. I believe you have seen the material in the past. Please do not disseminate outside of the OCC. The paper upon which this presentation is based has been accepted with minor revisions in the journal Geology.

Best,

Katie Keranen
Assistant Professor, Geophysics
University of Oklahoma

AGU.Keranen.2012.pdf


ATT00001.txt

Re: lines

Nancy Dorsey to: Charles Lord 12/19/2012 01:21 PM

Fault_3D_line_view.jpg You want a more or less equally spaced grid, but also to catch well control and the big earthquakes, something like the attached. Though I doubt the 3D covers that much area.

Charles Lord From: Charles Lord <C.Lord@occemail.com> T... 12/19/2012 11:29:12 AM

From: Charles Lord <C.Lord@occemail.com>
To: Nancy Dorsey/R6/USEPA/US@EPA
Date: 12/19/2012 11:29 AM
Subject:

[attachment "FaultQuakeMap_12-19-2012 for OGS meeting.pdf" deleted by Nancy Dorsey/R6/USEPA/US]

RE: lines

Charles Lord to: Nancy Dorsey 12/19/2012 01:52 PM

History: This message has been replied to.

Thanks Nancy. Is that a graphic or did you make a shapefile?

If you made a shapefile could you forward it to me.

Lines were well drawn, through EQ events and two UIC wells on one.

Thanks,

Charles

From: Dorsey.Nancy@epamail.epa.gov [mailto:Dorsey.Nancy@epamail.epa.gov]
Sent: Wednesday, December 19, 2012 1:21 PM
To: Charles Lord
Subject: Re: lines

You want a more or less equally spaced grid, but also to catch well control and the big earthquakes, something like the attached. Though I doubt the 3D covers that much area.

From: Charles Lord <C.Lord@occemail.com>
To: Nancy Dorsey/R6/USEPA/US@EPA
Date: 12/19/2012 11:29 AM
Subject:

[attachment "FaultQuakeMap_12-19-2012 for OGS meeting.pdf" deleted by Nancy Dorsey/R6/USEPA/US]

RE: lines
Charles Lord to: Nancy Dorsey 12/19/2012 02:40 PM

Thank you Nancy, I will ask all these questions.

From: Dorsey.Nancy@epamail.epa.gov [mailto:Dorsey.Nancy@epamail.epa.gov]
Sent: Wednesday, December 19, 2012 2:17 PM
To: Charles Lord
Subject: RE: lines

It was a jpg. I could probably redraw it in ArcMap if you needed it, but they geophysicists are probably going to eyeball it anyway.

A few other general thoughts when dealing with processed seismic:

1. For what purpose was the data processed?
    - If they are going for a particular horizon, the data below it may not be very interpretable.
    - It may have been processed to emphasize hydrocarbon signatures, which may also change things.
    - For 3D, how large was the bin size? That used to control how close in you could zoom, kind of like a pixel size.
2. Is the data in time or depth?
3. Is the data interpreted?
    - How much well control was used to pick the correlations?
    - Where there VSP's (vertical seismic profile) or Check shots run? Or was another method used to convert depth to time to pick the points?
    - If the Arbuckle or another horizon was interpreted ask to see the surface displayed. That will show you all the fault breaks.
4. How does the structure look?
    - Is the basement or top granite wash identifiable?
    - Do younger faults offset the older faults?
    - Can the 'Wilzetta' fault or fault zone actually be identified? It was drawn from a very regional scale, so the question of location accuracy is very apro po.

FW: Wilzetta fault 3d survey

Charles Lord to: Nancy Dorsey 12/27/2012 02:13 PM

Nancy, have "some got to have it now" projects from those above me.

The 3D was very interesting.

Will call tomorrow.

Charles

-----Original Message-----
From: Keller G. Randy [mailto:grkeller@ou.edu]
Sent: Friday, December 21, 2012 1:58 PM
To: Austin Holland
Cc: Ron Dunkin; Charles Lord
Subject: Re: Wilzetta fault 3d survey

Hi all: This sounds very interesting and important. I look forward to seeing the data myself. I feel confident that we can figure out a way to at least get some images of the data that do not compromise the proprietary concerns of the company.

Happy Holidays, Randy

On Dec 21, 2012, at 1:52 PM, Austin Holland <austin.holland@ou.edu> wrote:

> The proprietary 3D seismic survey which we were shown this morning by Bryan Waller was very scientifically interesting. It clearly shows a great deal of complexity for the Wilzetta fault. There is also a great deal of complexity and structure in the basement. There is not however evidence that there is a block bounded fault in the location of the STASTA wells. What had been interpreted as a completely fault bounded block might be better described as a structural high bounded by the Wilzetta fault to the east. The survey clearly showed continuity within the Hunton such that we should not expect to see a confined aquifer in the area. The fold structure which generates the structural high could be interpreted as a significant fault to the west of the STASTA wells if only interpreting from well logs without the aid of the 3D survey. Mr. Waller has graciously invited us to come take a further look and we are examining the avenues of getting at least some images of this proprietary data released.
>
>
> Regards,
> Austin Holland
>
>

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> --
> Austin Holland
> Research Seismologist
> Oklahoma Geological Survey
> (405)325-8497